

Pharmacognostic Studies on Chinese Crude Drugs “Dunyeibixie”(盾叶草薢) and “Xibixie”(细草薢)

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Abstract Macroscopic, microscopic characteristics of Rhizoma *Dioscorea zingiberensis* and *D. tenuipes* as well as their ultramicro characteristics of vessel inner walls were studied. Results showed that their macroscopic, microscopic and ultramicro characteristics, though very similar in monocotyledonous generalities, yet there existed some specific differences which could be used as a basis to differentiate one from the other.

Key Words Dunyeibixie (Rhizome of *Dioscorea zingiberensis*) Xibixie (Rhizome of *Dioscorea tenuipes*) morphology histology Scanning Electron Microscope (SEM)

Chinese crude drugs “Dunyeibixie”(盾叶草薢 *Rhizoma Dioscorea zingiberensis*) and “Xibixie”(细草薢 *Rhizoma D. tenuipes*) originated from plants in Sect. stenophora of Genus *Dioscorea* (*Dioscoreaceae*). They are important raw materials for semi-synthetic steroids, such as cortisone and fluo-hydrocortisons because of their rich and relatively pure content of diosgenin. Their economical value becomes increasingly important with the ever-increasing demand of diosgenin. The chemical constituents of the crude drugs have been extensively reported^[1~7], but a detailed pharmacognostic study on their macro-, micro and ultramicroscopic studies were still lacking. We wish to report the results of our study to provide evidences for their identification and utilization.

Plant materials used in the experiment were collected from Zhejinag Province. “Dunyeibixie” from Guanlu, Xianju (仙居官路), while “Xibixie” from Xikou, Fenghua

(奉化溪口) and Yanglin, Kaihua (开化杨林). All specimens were identified by the authors.

1 Macroscopic Characteristics

1.1 “Dunyeibixie”: Rhizome cylindrical, often curved, with thick, short branches and clear joints, 10 cm~25 cm in length and 0.8 cm~2.2 cm in diameter. Surface, dark brown, coarse, reticulated or scaly. Root scars protruding slightly and stem scars with buds projecting like tumors. Thick, sturdy bud growing spots can be seen on the distal end of the rhizome. Texture hard and brittle. Sliced sections, pale yellow or pale orange, powdery, with spots of vascular bundles scattered irregularly all over. Odour, slight; taste, slightly bitter and irritating.

1.2 “Xibixie”: Rhizome cylindrical, often curved, with branches, 10 cm~20 cm in length, and 0.3 cm~1.5 cm in diameter. Surface, withering yellow, wrinkled longitudinally, with spots of hollows pits show-

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ing circular or semicircular lines. Root scars protruding slightly and stem scars cone shaped or cylindrical, with one or several buds. Texture hard and brittle. Sliced sections white or grey-white, powdery, spots of vascular bundles irregularly scattered. Odour, slight; taste, slightly bitter.

2 Microscopic Characteristics

2.1 “Dunyeboxie”: Transverse section about 1.5 cm in diameter. Epidermal cells exfoliated with only 4~8 rows of parenchymatous cells remaining on its outer surface. 6~8 rows of cork cells originated at the cortex, strongly elongated tangentially, and regularly arranged, with slightly thickened

and lignified pitted walls. Cortex consisted of only 3~4 rows of parenchymatous cells, tangentially elongated, somewhat regularly arranged, with very thin walls. Parenchymatous cells of stele multiangular, thin walled. Mucilaginous cells distributed mainly in the cortex, and occasionally in the parenchymatous tissue (P.T.) of stele. Raphides of calcium oxalate parallel to the rhizome, existing in mucilaginous cells. Starch granules distributed all over the P.T. of stele. Closed collateral vascular bundles scattered in stele. Vessels in xylem, multiangular to elliptical and sieve tubes in phloem multiangular (Fig. 1).

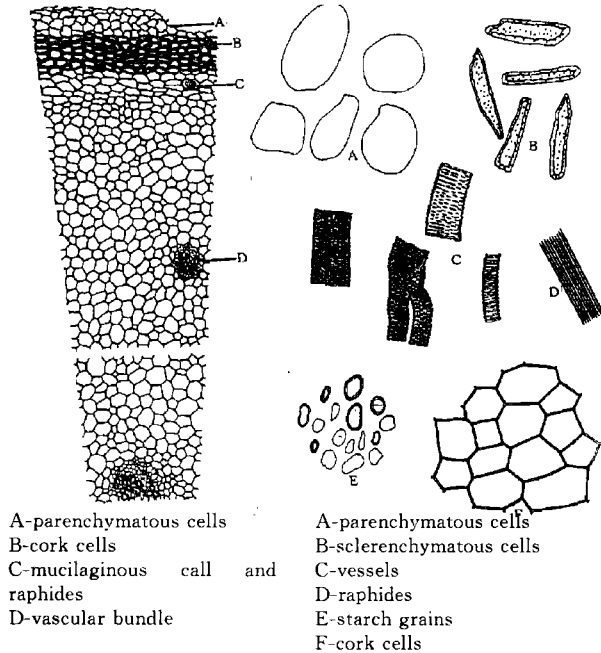


Fig. 1 Cross section of Dunyeboxie

Powder; Parenchymatous cells circular, elliptical or irregularly shaped, with thin walls. Vessels reticulated, bordered or spiral, and occasionally branched, 20 μm~40 μm~85 μm in diameter. Sclerenchymatous cells fibrous, with lignified and pitted walls. Cord cells multiangular, closely arranged like mosaic. Starch granules ellipti-

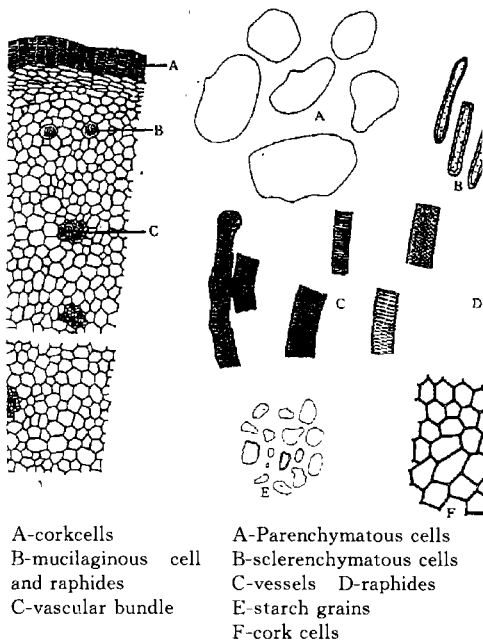


Fig. 3 Cross Section of Xibixie

Fig. 4 Powders of Xibixie

cls, triangular or irregularly shaped, 10 μm~25 μm~45 μm in length and 6 μm~15 μm~30 μm in diameter, hilum pointed or cleft-like, visible occasionally, some with striations. Raphides of calcium oxalate 95 μm~140 μm in length, with sharp ends (Fig. 2).

2.2 “Xibixie”: Transverse section about 1

cm in diameter with characteristics similar to that of "Dunyeibixie", but different in the following instances: outer most cork layer consisted of 4~9 rows of cells, strongly elongated, tangentially, regularly arranged, with neither thickened nor lignified walls. Outside the cork, a small number of residual parenchymatous cells with wrinkled walls remained occasionally. Mucilaginous cells distributed mainly in the outer part of P.T. of stele. Closed collateral vascular bundles scattered in stele, arranged in a ring at the central part of stele(Fig. 3).

Powder, Parenchymatous cells sub-rectangular, circular elliptical or irregularly shaped, with very thin walls and occasionally protruded abtuse on walls. Vessels reticulated, bordered or spiral, with branches occasionally, $20\text{ }\mu\text{m}\sim 35\text{ }\mu\text{m}\sim 65\text{ }\mu\text{m}$ in diameter. Sclerenchymatous cells multiangular, closely arranged like mosaic. Starch granules elliptical, circular, triangu-

lar or irregularly shaped, $10\text{ }\mu\text{m}\sim 20\text{ }\mu\text{m}\sim 45\text{ }\mu\text{m}$ in length, $7\text{ }\mu\text{m}\sim 15\text{ }\mu\text{m}\sim 35\text{ }\mu\text{m}$ in diameter, hilum pointed or lineally shaped, visible sometimes, without clear striations. Raphides of calcium oxalate $65\text{ }\mu\text{m}\sim 130\text{ }\mu\text{m}$ in length, with sharp ends(Fig. 4).

3 Ultramicro Characteristics of Vessel Inner Walls

Vertical microscopical sections were fixed on the platform of specimen after dewaxing, The sections are metal plated by spraying and the inner walls of vessel were observed and photographed by Scanning Electron Microscope.

3.1 "Dunyeibixie": Inner walls of reticulated vessels scabrous, without clear interval belt, about 44 pits per $1000\text{ }\mu\text{m}^2$, arranged alternately, occasionally juxtaposed. Shapes of pit elliptical or circular. Pits, $1.2\text{ }\mu\text{m}\sim 7\text{ }\mu\text{m}$ in length and $0.8\text{ }\mu\text{m}\sim 2\text{ }\mu\text{m}$ in breadth (Fig. 5).

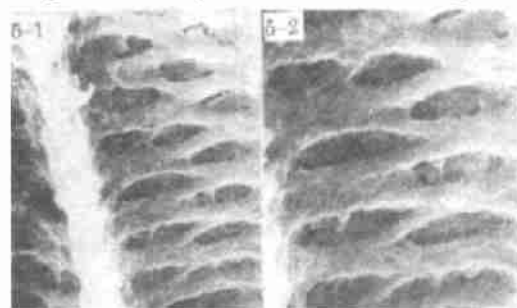


Fig. 5 Vessel Inner Walls of Dunyeibixie

3.2 "Xibixie" Inner walls of reticulated vessels scabrous, without clear interval belt, 77 pits per $1000\text{ }\mu\text{m}^2$, arranged alternately. Shapes of pit elliptical or long ellipse, $2\text{ }\mu\text{m}\sim 5.3\text{ }\mu\text{m}$ in length and $0.3\text{ }\mu\text{m}\sim 1.3\text{ }\mu\text{m}$ in breadth(Fig. 6).

4 Discussion

Both "Dunyeibixie" and "Xibixie" originated from the monocotyledonous rhizomes, and, therefore, they both inherited the

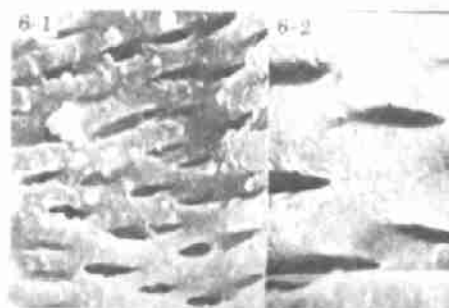


Fig. 6 Vessel Inner Walls of Xibixie

morphological and histological generalities of monocotyledonous rhizomes. For example, they both possess scars of stems and roots on the rhizomes. Closed collateral vessels were scattered over stele, and there are mucilaginous cells and raphides of calcium oxalate in parenchymatous tissue, but there were also some special features that were not common in monocotyledons, such as cork cells can be found outside and the

vessels are reticulated or bordered etc. These differences could be used to differentiate the two drugs from each other.

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(1998-03-23 收稿)

摘要 盾叶草蓼和细草蓼皆来源于薯蓣属草蓼植物的根茎,它们形态相似,为研究它们的生药特征并鉴别之,通过宏观性状观察、显微镜微观结构探索及扫描电镜超微结构研究,结果发现该两药材的宏观、微观和超微结构既有单子叶植物的共同特征,也有单子叶植物不常具有的特征。两药材的上述生药特征大多相似,但也有些差异,利用这些差异可对两药材进行鉴别。

关键词 盾叶草蓼(盾叶薯蓣) 细草蓼(细柄薯蓣) 形态学 组织学 扫描电镜

小叶买麻藤的生药鉴定

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摘要 利用药材性状、显微特征、紫外吸收光谱和薄层层析等鉴别方法对小叶买麻藤进行生药鉴定研究,为该药材的鉴别和开发利用提供科学依据。

关键词 小叶买麻藤 药材性状 显微特征 紫外吸收光谱 薄层层析

小叶买麻藤又名麻骨风,买子藤、驳骨藤、大节藤。来源于买麻藤科植物小叶买麻藤的干燥藤茎。具有祛风活血等功效,用于风湿性关节炎、跌打损伤等症^[1]。治疗慢性支气管炎功效独特显著^[2]。生药鉴别研究未见有报道,为利于开发利用这一野生资源,就此进行研究。

1 仪器与材料

1.1 仪器:UV-160A 型可见紫外分光光度计(岛津),ZF-I 型三用紫外分析仪。

1.2 材料:小叶买麻藤采自南宁市郊区,经本院刘寿养副教授鉴定为买麻藤科植物小叶买麻藤 *Gnetum parvifolium* (Warb.) C. Y. Cheng 的藤茎。硅胶 H(青岛海洋化工厂),实验所用试剂均为分析纯。

2 方法与结果

2.1 药材性状:本品类圆柱形,茎节膨大,外皮棕褐色至黑褐色,略粗糙,具不规则纵纹和细横纹,灰褐色皮孔大多磨损成许多黄白色麻点。切面是灰褐至黄褐色,有 2 层~5 层棕色环,有多数放射性排列的小孔,髓部呈灰棕至棕褐色,质稍轻,气微,味淡微苦(图 1)。

2.2 显微特征

2.2.1 藤茎横切面:a)木栓层细胞数 10 列,细胞呈黄褐色,且颜色往外逐层加深。b)皮层细胞长圆形、长方形或类方形,胞腔内充满淀粉粒。近木栓层处有 1 列石细胞组成的不连续石细胞层;近韧皮部处有由 2 列~4 列石细胞组成的连续石细胞层,在两个石细胞层之间有众多纤维存在。c)韧皮部外方有约

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